AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1 (Original): A method of administering a bioactive agent to cells of a targeted tissue site of a subject which comprises administering to said subject an effective amount of the bioactive agent as a bioconjugate, said bioconjugate comprises the bioactive agent and an organocobalt complex wherein the bioactive agent is covalently conjugated to the cobalt atom through a non-reactive atom in the bioactive agent molecule.

2 (Original): The method of claim 1, wherein said cells of said targeted tissue site have an affinity for the organocobalt complex portion of said bioconjugate.

3 (currently amended): The method of claim 1, wherein said cells of said targeted tissue site have an affinity for ~~the~~ a targeting molecule of the organocobalt complex portion of said bioconjugate.

4 (Original): The method of claim 1, wherein said bioconjugate is administered intravenously.

5 (Original): The method of claim 1, wherein said bioconjugate is administered parenterally.

6 (Original): The method of claim 1, wherein said bioconjugate is administered orally.

7 (Original): The method of claim 1, wherein said bioconjugate is administered intramuscularly.

8 (Original): The method of claim 1, wherein said bioconjugate is administered intrathecally.

9 (Original): The method of claim 1, wherein said bioconjugate is administered as an aerosol.

10 (Original): The method of claim 1, wherein said targeted tissue site is neoplastic tissue and said bioactive agent is an anticancer agent.

11 (Original): The method of claim 10, wherein said neoplastic tissue is tissue of a sarcoma.

12 (Original): The method of claim 10, wherein said neoplastic tissue is tissue of a carcinoma.

13 (Original): The method of claim 10, wherein said neoplastic tissue is tissue of a leukemia.

14 (Original): The method of claim 1, wherein said targeted tissue site is tissue afflicted with psoriasis and said bioactive agent is a cytotoxic agent or anti-metabolite.

15 (Original): The method of claim 1, wherein said targeted tissue site is tissue for the application of gene therapy and said bioactive agent is an oligonucleotide or a polynucleotide.

16 (Original): The method of claim 15, wherein said oligonucleotide is antisense DNA or RNA.

17 (Original): The method of claim 1, wherein said targeted tissue site is tissue for the application of peptide therapy and said bioactive agent is a peptide or protein.

18 (Original): The method of claim 1, wherein a bolus of vitamin B_{12} is administered prior to administration of said bioconjugate.

19 (Original): The method of claim 1, wherein nitrous oxide is administered first to deplete body stores of vitamin B_{12}.

20 (Original): The method of claim 1, wherein said non-reactive atom is selected from the group consisting of a carbon atom, a nitrogen atom, an oxygen atom, a sulfur atom, a selenium atom or a silicon atom.

21 (Original): The method of claim 1, wherein said non-reactive atom is a carbon atom.

22 (Original): The method of claim 1, wherein the non-reactive carbon atom is a carbon atom from an alkyl, acyl or aryl group that will not lead to rearrangement or destruction of the bioactive agent under conditions of ligand exchange during receptor-mediated endocytosis.

23 (Original): The method of claim 1, wherein said bioactive agent is covalently bound directly to the cobalt atom of the organocobalt complex.

24 (Original): The method of claim 1, wherein said bioactive agent is covalently bound indirectly to the cobalt atom of the organocobalt complex via a spacer.

25 (Original): The method of claim 24, wherein said spacer is a self-destructing linker.

26 (Original): The method of claim 1, wherein said bioactive agent is a diagnostic compound.

27 (Original): The method of claim 1, wherein said bioactive agent is a drug.

28 (Original): The method of claim 27, wherein said bioactive agent is an anticancer agent.

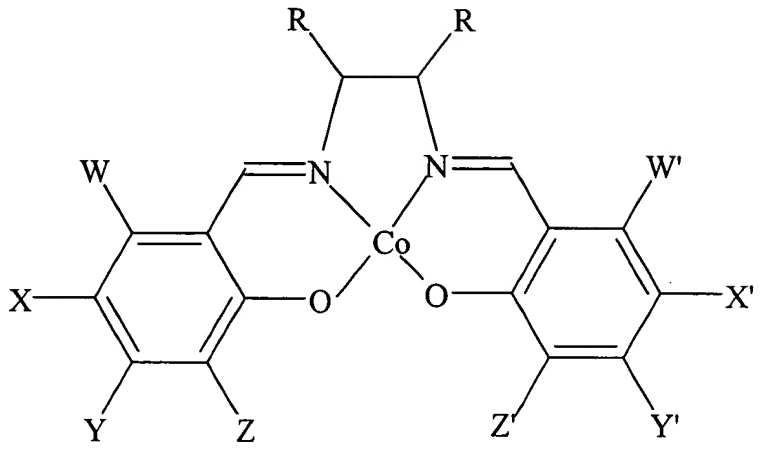
29 (Original): The method of claim 1, wherein said bioactive agent is a peptide, peptide analogue, protein or protein analogue.

30 (Original): The method of claim 1, wherein said bioactive agent is a nucleic acid or a nucleic acid analogue.

31 (Original): The method of claim 30, wherein said nucleic acid or nucleic acid analogue is a polynucleotide, oligonucleotide, antisense DNA or antisense RNA.

32 (currently amended): The method of claim 1, wherein said organocobalt complex is cobalamin, cobalamin lactone, cobalamin lactam, or a cobalamin derivative ~~or a cobalamine analogue~~, wherein said cobalamin derivative is (a) cobalamin in which the benzimidizaole ring is substituted with a halogen, hydroxy or a C_{1-6} alkyl, (b) an anilide, ethylamide, monocarboxylic acid, dicarboxylic acid, tricarboxylic acid or proprionamide derivative of cobalamin, or (c) cobalamin substituted with an amino, a nitro, a halogen, a sulfito, a C_{2-6} alkylene or a C_{2-6} alkyne.

33 (currently amended): The method of claim 1, wherein said organocobalt complex is a compound having the following formula:



wherein ~~the substituents may be included or omitted to modulate physical properties of the molecule, e.g., water solubility, stability of λ_{max} -- the wavelength at which the complex absorbs~~ R is H, amino, C_{1-6} alcohol, or C_{1-6} carboxyl, W, W', X, X', Y, Y', Z and Z' are independently H, amino, C_{1-6} alcohol, C_{1-6} carboxyl, SO_3-, CH_2OH, CO_2H, or nitro, or W and X together form a 4-6 member cyclic or heterocyclic ring, or W' and X' together form a 4-6 member cyclic or heterocyclic ring, or Y and Z together form a 4-6 member cyclic or heterocyclic aromatic ring or Y' and Z' together form a 4-6 member cyclic or heterocyclic aromatic ring.

34 (currently amended): The method of claim 33, which further comprises a targeting molecule covalently linked to one of said R, W, W', X, X', Y, Y', Z or Z, wherein said targeting molecule is selected from the group consisting of glucose, galactose, mannose, mannose 6-phosphate, transferrin, cobalamin, asialoglycoprotein, α-2-macroglobulins, insulin, a peptide growth factor, folic acid or derivatives, biotin or derivatives, YEE(GalNAcAH)$_3$ or derivatives, albumin, texaphyrin, metallotexaphyrin, a vitamin, a coenzyme, an antibody, an antibody fragment and a single-chain antibody variable region (scFv).

35 (currently amended): The method of claim 1, wherein said organocobalt complex is selected from the group consisting of organo(pyridine)bis(dimethylglyoximato)cobalt, a corrinoid,or derivatives thereof ~~and analogues thereof~~, wherein said derivative is (a) a corrinoid in which the benzimidizaole ring is substituted with a halogen, hydroxy or a C_{1-6} alkyl, (b) a corrinoid substituted with an amino, a nitro, a halogen, a sulfito, a C_{2-6} alkylene or a C_{2-6} alkyne, or (c) organo(pyridine)bis(dimethyl-glyoximato)cobalt substituted with an amino, a nitro, a halogen, a sulfito, a C_{2-6} alkylene or a C_{2-6} alkyne.

36 (Original): The method of claim 1, wherein said organocobalt complex comprises a multiple unsaturated heterocyclic ring system bonded to a cobalt atom through 4-5 nitrogens and/or chalcogens which are part of said ring system.